Notice of Allowability	Application No.	Applicant(s)	
	09/941,101	MATTHEWS, PHILLIP M.	
	Examiner	Art Unit	
	Jean B. Jeanglaude	2819	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *08-27-01*.

2. ☒ The allowed claim(s) is/are *1-56*.

3. ☒ The drawings filed on *27 August 2001* are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 12-10-01
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Jean Bruner Jeanglaude

Jean Bruner Jeanglaude
Primary Examiner

Reasons For Allowance

Claims 1 – 56 are allowable.

1. The following is an examiner's statement of reasons for allowance: in combination with other limitations of the claims the prior arts made of record fail to suggest an encoding system adapted to encode data strings into codewords comprising an encoder adapted to receive from a second memory portion a data string to be processed, to determine if a codeword corresponding to a portion of the data string to be processed is stored in a dictionary and to output a codeword corresponding to a data string previously found in the dictionary if the codeword corresponding to the portion of the data string to be processed is not stored in the dictionary, wherein the encoder is further adapted to balance the dictionary. Moreover, in combination with other limitations of the claims the prior arts made of record fail to suggest a decoding system adapted to decode codewords into data strings comprising a decoder adapted to receive from an input buffer set of codewords to be processed, to decode a first codeword into a first character string, to decode a second codeword into a second character string and to assign a third codeword to a combination of a first codeword and the second character string if a codeword corresponding to the combination of the first codeword and the second character string is not stored in the dictionary wherein the decoder is further adapted to balance the dictionary. Furthermore, in combination with other limitations of the claims, the prior arts made of record fail to suggest an encoder adapted to operate with a first memory portion adapted to store a dictionary of data strings and codewords corresponding to the data strings wherein the dictionary is

implemented as a balanced binary tree and a second memory portion adapted to receive and store a data string to be processed, the encoder comprising a second hardware state machine adapted to determine if a codeword corresponding to a portion of the data string to be processed is stored in the dictionary and to output a codeword corresponding to a data string previously found in the dictionary if the codeword corresponding to the portion of the data string to be processed is not stored in the dictionary and a third hardware state machine adapted to balance the dictionary. Also, in combination with other limitations of the claims the prior arts made of record fail to suggest a decoder adapted to operate with a memory adapted to store a dictionary of data strings and codewords to the data strings wherein the dictionary is implemented as a balance tree and an input buffer adapted to receive and store a set of codewords to be processed, the decoder comprises a second hardware state machine adapted to decode a first codeword into a first character string, to decode a second codeword into a second character string and to assign a third codeword to a combination of the first codeword and the second character string if a codeword corresponding to the combination of the first codeword and the second character string is not stored in the dictionary and a third hardware state machine adapted to balance the dictionary.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

2. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

3. Fiala et al. (US Patent Number 5,058,144) discloses a search tree data structure encoding for textual substitution data compression systems.

4. Lempel et al. (US Patent Number 5,373,290) discloses an apparatus and method for managing multiple dictionaries in content addressable memory based data compression.

5. Clark, II et al. (US Patent Number 5,455,576) discloses an apparatus and methods for Lempel Ziv data compression with improved management of multiple dictionaries in content addressable memory.

6. Grinberg et al. (US Patent Number 5,384,568) discloses a data compression.

7. Elgamal et al. (US Patent Number 5,410,671) discloses a data compression/decompression processor.

8. Whiting et al. (US Patent Number 5,463,390) discloses a data compression apparatus and method.

9. Tobin (US Patent Number 5,485,526) discloses a memory circuit for lossless data compression/decompression dictionary storage.

10. Wu (US patent Number 5,488,366) discloses a segmented variable length decoding apparatus for sequentially decoding single codeword within a fixed number of decoding cycles.

11. James (US Patent number 5,533,051) discloses a method for data compression.

12. Clark (US Patent Number 5,627,533) discloses an adjusting encoding table size and memory allocation for data compression in response to input data.

13. Clark, II et al. (US patent Number 5,686,912) discloses a data compression method and apparatus with optimized transitions between compressed and uncompressed modes.

14. Frazier et al. (US patent Number 5,689,255) discloses a method and apparatus for compressing and decompressing image data.

15. Kalkstein (US Patent Number 5,945,933) discloses an adaptive packet compression apparatus and method.

16. Reynar et al. (US patent number 5,951,623) discloses a Lempel-Ziv data compression technique utilizing a dictionary pre-filled with frequent letter combinations, words and or phrases.

17. Satoh (US Patent Number 6,320,522) discloses an encoding and decoding apparatus with matching length detection means for symbol strings.

18. Chen et al. (US paten number 6,377,930) discloses a variable-to-variable length entropy encoding.

19. Southwell (US patent Number 6,378,0070 discloses a data encoding scheme.

20. Fallon et al. (US patent number 6,597,812) discloses a system and method for lossless data compression and decompression.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean B. Jeanglaude whose telephone number is 571-

272-1804. The examiner can normally be reached on Monday - Friday 7:30 A. M. - 5:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Tokar can be reached on 571-272-1812. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jean Bruner Jeanglaude
Primary Examiner
May 17, 2005